

ABSTRACT OF THE DISCLOSURE

A process and related structure are disclosed for using photo-definable layers that may be selectively converted to insulative materials in the manufacture of semiconductor devices, including for example dynamic random access memories (DRAMs), synchronous DRAMs (SDRAMs), static RAMs (SRAMs), FLASH memories, and other memory devices. One possible photo-definable material for use with the present invention is plasma polymerized

methysilane (PPMS), which may be selectively converted into photo-oxidized siloxane (PPMSO) through exposure to deep ultra-violet (DUV) radiation using standard photolithography techniques. According to the present invention, structures may be formed by converting exposed portions of a photo-definable layer to an insulative material and by using the non-exposed portions in a negative pattern scheme, or the exposed portions in a positive pattern scheme, to transfer a pattern into to an underlying layer. The remaining portions of the photo-definable layer may also be left as an insulator layer within the completed semiconductor device.

Representative examples of structures which may be formed according to the present invention include, but are not limited to, dielectric layers, trenches for contacts, self-aligned contacts, conductors, insulators, capacitors, gates, source/drain junctions, and the like.